

BIOCHEMICAL AND BIOPHYSICAL

# Research Communications

EDITORS:

*Paul D. Boyer*

*Jacques Monod*

*I. C. Gunsalus*

*Frederick C. Neidhardt*

*B. L. Horecker*

*W. D. Phillips*

*Boris Magasanik*

*Esmond E. Snell*

Volume 57 • 1974



ACADEMIC PRESS

*New York and London*

A Subsidiary of Harcourt Brace Jovanovich, Publishers

*Copyright © 1974 by Academic Press, Inc.*

ALL RIGHTS RESERVED

No part of this publication may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

*Made in the United States of America*

# Contents of Volume 57

Volume 57, Number 1, March 15, 1974

|                                                                                                                                                                                                       |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| AUTHOR INDEX. Volume 57, Number 1 . . . . .                                                                                                                                                           | ii  |
| FREDERICK E. BROT, JANET H. GLASER, KENNETH J. ROOZEN, and WILLIAM S. SLY. <i>In Vitro</i> Correction of Deficient Human Fibroblasts by $\beta$ -Glucuronidase from Different Human Sources . . . . . | 1   |
| N. D. DENSLOW and T. W. O'BRIEN. Susceptibility of 55S Mitochondrial Ribosomes to Antibiotics Inhibitory to Prokaryotic Ribosomes, Lincomycin, Chloramphenicol and PA114A . . . . .                   | 9   |
| JÚLIUS ŠUBÍK, MIROSLAV BEHŮN, and VLADIMÍR MUSILEK. Antibiotic Mucidin, A New Antimycin A-Like Inhibitor of Electron Transport in Rat Liver Mitochondria . . . . .                                    | 17  |
| STEPHEN M. BOYLE and BRUCE H. SELLS. Activity of Polypeptide Chain Initiation Factors during a Nutritional Shift-Up in <i>Escherichia coli</i> . . . . .                                              | 23  |
| URSULA STORB. Evidence for Multiple Immunoglobulin Genes . . . . .                                                                                                                                    | 31  |
| MIHO TAKAHASHI, TUN T. WANG and THEO HOFMANN. Acyl Intermediates in Pepsin and Penicillopsin Catalyzed Reactions . . . . .                                                                            | 39  |
| LLOYD A. SCHICK and FRANCIS J. CASTELLINO. Direct Evidence for the Generation of an Active Site in the Plasminogen Moiety of the Streptokinase-Human Plasminogen Activator Complex . . . . .          | 47  |
| SCOT HICKMAN, LARRY J. SHAPIRO, and ELIZABETH NEUFELD. A Recognition Marker Required for Uptake of a Lysosomal Enzyme by Cultured Fibroblasts . . . . .                                               | 55  |
| L. K. DUNICAN and A. B. TIERNEY. Genetic Transfer of Nitrogen Fixation from <i>Rhizobium trifolii</i> to <i>Klebsiella aerogenes</i> . . . . .                                                        | 62  |
| E. HOUGH and D. ROGERS. The Crystal Structure of Ferrimycobactin P, A Growth Factor for the <i>Mycobacteria</i> . . . . .                                                                             | 73  |
| ISAO TOMITA, SHIN-ICHI SAITOU OZAWA, and TATSUO OZAWA. Coenzyme Analogue Inhibition in the Reconstitution of Yeast Pyruvate Decarboxylase and Transketolase . . . . .                                 | 78  |
| FRED C. HARTMAN and MARY H. WELCH. Identification of the Histidyl Residue of Rabbit Muscle Aldolase Alkylated by <i>N</i> -Bromoacetyethanolamine Phosphate . . . . .                                 | 85  |
| HANN-PING WANG, D. R. PFIEFFER, TOKUJI KIMURA, and T. T. TEHEN. Phospholipids of Adrenal Cortex Mitochondria and the Steroid Hydroxylases: The Lipid-Environment of Cytochrome P-450 . . . . .        | 93  |
| FRANK BOWYER and ABBAS E. KITABCHI. Dual Role of Calcium in Steroidogenesis in the Isolated Adrenal Cell of Rat . . . . .                                                                             | 100 |
| WILLIAM C. KENNEY, DALE E. EDMONDSON, and THOMAS P. SINGER. A Novel Form of Covalently Bound Flavin from Thiamine Dehydrogenase . . . . .                                                             | 106 |
| F. J. VAN DER OUDERA, W. W. DE JONG, G. W. GROENENDIJK, and H. BLOEMENDAL. Sequence of the first 68 Residues of the $\alpha B_2$ Chain of Bovine $\alpha$ -Crystallin . . . . .                       | 112 |
| M. HERBST and P. PIONTEK. Changes of Stiffness of Skeletal Muscle during Latency Relaxation . . . . .                                                                                                 | 120 |
| EMMANUEL NUNEZ, GENEVIEVE VALLETTE, CLAUDINE BENASSAYAG and MAX-FERNAND JAYLE. Comparative Study on the Binding of Estrogens by Human and Rat Serum Proteins in Development . . . . .                 | 126 |
| JEANDELCOUR and JOHN PAPACONSTANTINOU. A Change in the Stoichiometry of Assembly of Bovine Lens $\alpha$ -Crystallin Subunits in Relation to Cellular Differentiation . . . . .                       | 134 |
| B. KETTERER, L. CHRISTODOULIDES, G. ENDERBY, and E. TIPPING. Mercapturic Acid Biosynthesis: The Separate Identities of Glutathione-S-Aryl Chloride Transferase and Ligandin . . . . .                 | 142 |
| PALLE WANG and GRETCHEN BANTLE. The Combined Effect of Glycogen and ATP on the D to I Conversion of Glycogen Synthetase . . . . .                                                                     | 148 |
| J. K. MARQUIS and H. G. MAUTNER. The Binding of Thiol Reagents to Axonal Membranes: The Effect of Electrical Stimulation . . . . .                                                                    | 154 |
| CLAUS W. HEIZMANN, DEAN A. MALENCIK and EDMOND H. FISCHER. Generation of Parvalbumin-like Proteins from Troponin . . . . .                                                                            | 162 |
| KAZUO SHISHIDO and TADAHIKO ANDO. Characterization of <i>Escherichia coli</i> RNA Polymerase-Binding Sites on f1 RFI DNA . . . . .                                                                    | 169 |
| JOSEPH C. BAGSHAW. New Evidence That Release of RNA Polymerase in Isolated Nuclei Requires Transcription . . . . .                                                                                    | 177 |



|                                                                                                                                                                                                                                      |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| S. S. SOFER, D. M. ZIEGLER, and R. P. POPOVICH. Synthesis of N-Oxides with a Hepatic Microsomal Drug Oxidase Insolubilized on Artificial Matrices . . . . .                                                                          | 183 |
| WILLIAM T. BUTLER, EDWARD J. MILLER, JOHN EDWARD FINCH, JR., and TADASHI INAGAMI. Homologous Regions of Collagen $\alpha 1(I)$ and $\alpha 1(II)$ Chains: Apparent Clustering of Variable and Invariant Amino Acid Residues. . . . . | 190 |
| S. J. BENKOVIC, W. A. FREY, C. B. LIBBY and J. J. VILLAFRANCA. The Role of Tryptophan in Neutral Fructose Diphosphatase . . . . .                                                                                                    | 196 |
| CHARLES S. McHENRY and DANIEL V. SANTI. A Sulfhydryl Group Is Not the Covalent Catalyst in the Thymidylate Synthetase Reaction . . . . .                                                                                             | 204 |
| O. GARCIA HERMIDA and J. GÓMEZ-ACEBO. A Different Pattern of Insulin Release in the Perfused Islets of the Rabbit . . . . .                                                                                                          | 209 |
| DAVID A. D. PARRY. Structural Studies on the Tropomyosin/Troponin Complex of Vertebrate Skeletal Muscle . . . . .                                                                                                                    | 216 |
| JEFFREY A. COHLBERG. Activity of Protein-Deficient 30S Ribosomal Subunits in Elongation Factor G-Dependent GTPase . . . . .                                                                                                          | 225 |
| PHILLIP NAGLEY, P. L. MOLLOY, H. B. LUKINS, and ANTHONY W. LINNANE. Studies on Mitochondrial Gene Purification using Petite Mutants of Yeast: Characterization of Mutants Enriched in Ribosomal RNA Cistrons . . . . .               | 232 |
| TOM ST. JOHN, JERRY D. JOHNSON, and JAMES BONNER. Degradation of Duplex DNA by $S_1$ Nuclease from <i>Aspergillus</i> . . . . .                                                                                                      | 240 |
| JOSEPH DeSIMONE, LOIS KLEVE, MARY ANN LONGLEY and JOSEPH SHAEFFER. Rapid Turnover of Newly Synthesized $\beta^S$ Chains in Reticulocytes from Individuals with Sick-Cell Trait . . . . .                                             | 248 |
| A. L. VERMA and H. J. BERNSTEIN. Resonance Raman Spectra of Metal-free Porphin and some Porphyrins . . . . .                                                                                                                         | 255 |
| K. TIMMIS, P. W. EARLY and D. A. MARVIN. Filamentous Bacterial Viruses. IX. Protein Synthesis Inhibitors and DNA Replication. . . . .                                                                                                | 263 |
| T. AOYAGI, J. SUZUKI, K. NEROME, R. NISHIZAWA, T. TAKEUCHI, and H. UMEZAWA. Sialic Acid Residues Exposed on Mammalian Cell Surface: The Effect of Adsorption on Denatured Virus Particles . . . . .                                  | 271 |
| ANNE M. HEACOCK and ELIJAH ADAMS. Hydroxy-L-Proline as a Substrate for Hog Kidney D-Amino Acid Oxidase . . . . .                                                                                                                     | 279 |
| BALTAZAR REYNAFARJE and ALBERT L. LEHNINGER. The Cause of Superstoichiometric $Ca^{2+}$ Uptake and $H^+$ Ejection in L1210 Mouse Ascites Tumor Mitochondria . . . . .                                                                | 286 |
| J. BERNSOHN and F. J. SPITZ. Linoleic- and Linolenic Acid Dependency of Some Brain Membrane-Bound Enzymes after Lipid Deprivation in Rats. . . . .                                                                                   | 293 |
| A. R. GLENN. The Effect of Ionic Strength on Alkaline Phosphatase . . . . .                                                                                                                                                          | 299 |
| K. MEGYESI, C. R. KAHN, J. ROTH, E. R. FROESCH, R. E. RUMBEL, J. ZAPF, and D. M. NEVILLE, JR. Insulin and Nonsuppressible Insulin-Like Activity (NSILA-s): Evidence for Separate Plasma Membrane Receptor Sites. . . . .             | 307 |
| TSUYOSHI OHNISHI, GREGG S. PRESSMAN and HENRY L. PRICE. A Possible Mechanism of Anesthetic-Induced Myocardial Depression . . . . .                                                                                                   | 316 |
| HARRY G. RITTENHOUSE and C. FRED FOX. Concanavalin a Mediated Hemagglutination and Binding Properties of LM Cells. . . . .                                                                                                           | 323 |
| ERRATUM<br>Volume 56, Number 1, January 7, 1974: Mukund J. Modak, Stuart L. Marcus and Liebe F. Cavalieri, Synthesis of DNA Complementary to AMV RNA Using <i>E. coli</i> Polymerase I, pp. 247-255 . . . . .                        | 332 |

## Volume 57, Number 2, March 25, 1974

|                                                                                                                                                                                                                                                                                       |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| AUTHOR INDEX, Volume 57, Number 2 . . . . .                                                                                                                                                                                                                                           | ii  |
| DAVID H. COY, ESTHER J. COY, ANDREW V. SCHALLY, JESUS VILCHEZ-MARTINEZ, YOSHIHIRO HIROTSU and AKIRA ARIMURA. Synthesis and Biological Properties of (D-ALA-6, DES-Gly-NH <sub>2</sub> -10)-LH-RH Ethylamide, A Peptide with Greatly Enhanced LH- and FSH-Releasing Activity . . . . . | 335 |
| W. S. KISTLER, C. NOYES and R. L. HEINRIKSON. Partial Structural Analysis of a Highly Basic Low Molecular Weight Protein from Rat Testis . . . . .                                                                                                                                    | 341 |
| AGNES ULLMANN. Are Cyclic AMP Effects Related to Real Physiological Phenomena? . . . . .                                                                                                                                                                                              | 348 |

|                                                                                                                                                                                                                                                                                       |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| DOMENICO GERACI, TAMILLA EREMENKO, ROBERTO COCCHIARA, ALDO GRANIERI, EDUARDO SCARANO, and PIETRO VOLPE. Correlation between Synthesis and Methylation of DNA in Hela Cells . . . . .                                                                                                  | 353 |
| JAMES M. COLLINS. Template Ability of Activated DNA From the Regenerating Lens . . . . .                                                                                                                                                                                              | 359 |
| MATTEO GIANNATTASIO, ENZA MANDATO, and VINCENZO MACCHIA. Content of 3',5' Cyclic AMP and Cyclic AMP Phosphodiesterase in Dormant and Activated Tissues of Jerusalem Artichoke Tubers . . . . .                                                                                        | 365 |
| SANGKOT MARZUKI, RUTH M. HALL, and ANTHONY W. LINNANE. Induction of Respiratory Incompetent Mutants by Unsaturated Fatty Acid Depletion in <i>Saccharomyces cerevisiae</i> . . . . .                                                                                                  | 372 |
| KNOWLTON POTTER, GILLIAN CHALONER-LARSSON, and HIROSHI YAMAZAKI. Abnormally High Rate of Cyclic AMP Excretion from an <i>Escherichia coli</i> Mutant Deficient in Cyclic AMP Receptor Protein . . . . .                                                                               | 379 |
| D. PARKER SUTTLE and JOANNE M. RAVEL. The Effects of Initiation Factor 3 on the Formation of 30S Initiation Complexes with Synthetic and Natural Messengers . . . . .                                                                                                                 | 386 |
| TAKAO KANAMORI, TARO HAYAKAWA, and TOSHIHARU NAGATSU. Adenosine 3',5'-Monophosphate-Dependent Protein Kinase and Amylase Secretion from Rat Parotid Gland . . . . .                                                                                                                   | 394 |
| S. C. S. CHANG, D. SIKKEMA and E. GOLDWASSER. Evidence for an Erythropoietin Receptor Protein on Rat Bone Marrow Cells . . . . .                                                                                                                                                      | 399 |
| JOACHIM SEELIG and ANNA SEELIG. Deuterium Magnetic Resonance Studies of Phospholipid Bilayers . . . . .                                                                                                                                                                               | 406 |
| HAJIME IWAMURA, TETSUO ITO, ZENZABRO KUMAZAWA, and YUKIYOSHI OGAWA. Anticytokinin Activity of 4-Furfurylamino-7-( $\beta$ -D-Ribofuranosyl) Pyrrrole [2,3-D]Pyrimidine . . . . .                                                                                                      | 412 |
| HILARY ASHE, BRIAN R. CLARK, FRED CHU, DOROTHY N. HARDY, BARBARA C. HALPERN, RICHARD M. HALPERN and ROBERTS A. SMITH. N <sup>5</sup> -Methyltetrahydrofolate: Homocysteine Methyltransferase Activity in Extracts from Normal, Malignant and Embryonic Tissue Culture Cells . . . . . | 417 |
| HUBERT E. MAY, RICHARD BOOSE, and DONALD J. REED. Hydroxylation of the Carcinostatic 1-(2-Chloroethyl)-3-Cyclohexyl-1-Nitrosourea (CCNU) by Rat Liver Microsomes . . . . .                                                                                                            | 426 |
| CECIL COOPER. The Structure of the Metal-Nucleotide Complex Substrate for Yeast Hexokinase . . . . .                                                                                                                                                                                  | 434 |
| N. A. RUBINSTEIN, J. C. H. CHI, and H. HOLTZER. Actin and Myosin in a Variety of Myogenic and Non-Myogenic Cells . . . . .                                                                                                                                                            | 438 |
| JAMES F. RIORDAN and GRAZYNA MUSZYNSKA. Difference between the Conformations of Nitrotyrosyl-248 Carboxypeptidase A in the Crystalline State and in Solution . . . . .                                                                                                                | 447 |
| B. J. DOWTY, N. E. BRIGHTWELL, J. L. LASETER, and G. W. GRIFFIN. Dye-Sensitized Photooxidation of Phenanthrene . . . . .                                                                                                                                                              | 452 |
| HSIN-HSIUNG TAI, CHEN L. TAI and CHARLES S. HOLLANDER. Regulation of Prostaglandin Metabolism: Inhibition of 15-Hydroxyprostaglandin Dehydrogenase by Thyroid Hormones . . . . .                                                                                                      | 457 |
| E. SULKOWSKI and M. LASKOWSKI, SR. Venom Exonuclease (Phosphodiesterase) Immobilized on Concanavalin-A-Sepharase . . . . .                                                                                                                                                            | 463 |
| B. CATHERWOOD and F. R. SINGER. Generation of a Carboxyl-Terminal Fragment of Bovine Parathyroid Hormone by Canine Renal Plasma Membranes . . . . .                                                                                                                                   | 469 |
| GILBERT J. MANNERING, SHIN-CHI KUWAHARA and TSUNEO OMURA. Immunochemical Evidence for the Participation of Cytochrome b <sub>5</sub> in the NADH Synergism of the NADPH-Dependent Mono-Oxidase System of Hepatic Microsomes . . . . .                                                 | 476 |
| JUDITH L. PACE, D. L. KEMPER, and W. L. RAGLAND. The Relationship of Molecular Weight to Electrophoretic Mobility of Fluorescamine-Labeled Proteins in Polyacrylamide Gels . . . . .                                                                                                  | 482 |
| HELENA B. NADER, NORMAN M. McDUFFIE and CARL P. DIETRICH. Heparin Fractionation by Electrofocusing: Presence of 21 Components of Different Molecular Weights . . . . .                                                                                                                | 488 |
| ALEXANDER McPHERSON, JOSHUA GELLER, and ALEXANDER RICH. Crystallographic Studies on Concanavalin B . . . . .                                                                                                                                                                          | 494 |
| MICHAEL V. KEENAN and WILLIAM L. ALWORTH. The Inhibition of Proline Racemase by a Transition State Analogue: $\Delta$ -1-Pyrroline-2-Carboxylate. . . . .                                                                                                                             | 500 |
| Y. SUZUKI and M. MATSUMOTO. Acid Phospholipase A <sub>1</sub> and A <sub>2</sub> in the Cells, and Subcellular Redistribution of Their Activities in the Cells Infected with Measles Virus . . . . .                                                                                  | 505 |



|                                                                                                                                                                                                                |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| D. P. EASTON, J. P. CHAMBERLAIN, A. H. WHITELEY, and H. R. WHITELEY.<br>Histone Gene Expression in Interspecies Hybrid Echinoid Embryos . . . . .                                                              | 513 |
| ELIZABETH AMBELLAN. Glucocorticoid Tight Binding in Rat Liver and Thymus<br>Particles . . . . .                                                                                                                | 520 |
| Y. LESHEM, SONIA PHILOSOPH, and JUDITH WURZBURGER. Glycosylation of<br>Free <i>trans-trans</i> Abscissic Acid as a Contributing Factor in Bud Dormancy Break . . . . .                                         | 526 |
| BARNARD L. TRUMPOWER, ASPANDIER KATKI, and PAUL HOROWITZ. En-<br>hancement of Rhodanese Activity during Controlled Digestion with Trypsin . . . . .                                                            | 532 |
| JOSEPH W. HORODNIAK, MARC JULIUS, JOHN E. ZAREMBO, and A. DOUGLAS<br>BENDER. Inhibitory Effects of Aspirin and Indomethacin on the Biosynthesis of<br>PGE <sub>2</sub> and PGF <sub>2</sub> $\alpha$ . . . . . | 539 |
| ANNOUNCEMENT . . . . .                                                                                                                                                                                         | 546 |

## ERRATA

|                                                                                                                                                                                                                                                                                                                                                  |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Volume 53, Number 2, July 17, 1973: Andrej Hasilik, and Helmut Holzer,<br>"Participation of the Tryptophan Synthase Inactivating System from Yeast in the<br>Activation of Chitin Synthase," pp. 552-559 . . . . .                                                                                                                               | 547 |
| Volume 56, Number 3, February 4, 1974: E. Brad Thompson, W. F. Benedict,<br>Ida S. Owens, and D. W. Nebert, "Aryl Hydrocarbon Hydroxylase and Tyrosine<br>Aminotransferase Activities in Somatic-Cell Hybrids Derived from Hepatoma<br>Tissue Culture HTC (RAT) Cells and 3T3 (MOUSE) Benzo (a) Pyrene-Resistant<br>Cells", pp. 605-610. . . . . | 547 |
| Volume 56, Number 4, February 27, 1974: Sendogan Guler, Peter C., Knott,<br>Charlotte E., and Tremblay, George C., "Evidence for the Control of Pyrimidine<br>Biosynthesis in Tissue Minces by Purines," pp. 934-939 . . . . .                                                                                                                   | 547 |

## Volume 57, Number 3, April 8, 1974

|                                                                                                                                                                                                      |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| AUTHOR INDEX, Volume 57, Number 3 . . . . .                                                                                                                                                          | ii  |
| E. DAHLBOM, B. R. TOLF, A. AKESON, C. LUNDQUIST, and H. THEORELL. On<br>the Inhibitory Power of Some Further Pyrazole Derivatives of Horse Liver Alcohol<br>Dehydrogenase . . . . .                  | 549 |
| ROGER W. ROESKE, SHERWIN ISAAC, T. E. KING, and L. K. STEINRAUF. The<br>Binding of Barium and Calcium Ions by the Antibiotic Beauvericin . . . . .                                                   | 554 |
| BINA OPPENHEIM, R. KOREN, and A. PATCHORNIK. D-Alanine Carboxypepti-<br>dase from <i>Streptococcus faecalis</i> . . . . .                                                                            | 562 |
| WILLIAM T. MORGAN, ENRIQUE H. VALLOTA, and HANS J. MÜLLER-<br>EBERHARD. Circular Dichroism of C5a Anaphylatoxin of Porcine Complement . . . . .                                                      | 572 |
| NORMAN PRATHER, JOANNE M. RAVEL, BOYD HARDESTY, and WILLIAM<br>SHIVE. Evidence for Activities of Rabbit Reticulocyte Elongation Factor 1<br>Analogous to Bacterial Factors EF-Ts and EF-Tu . . . . . | 578 |
| DAVID A. JOHNSON, RALPH N. PANNELL, and JAMES TRAVIS. The Molecular<br>Stoichiometry of Trypsin Inhibition by Human Alpha-1-Proteinase Inhibitor . . . . .                                           | 584 |
| MARTIN B. VAN DER NEYDEN, REBECCA H. BUCKLEY, and WILLIAM N.<br>KELLEY. Molecular Form of Adenosine Deaminase in Severe Combined Immuno-<br>deficiency. . . . .                                      | 590 |
| S. M. PEMRICK. The Effect of Treatment with 5,5'-Dithiobis-(2-Nitrobenzoic Acid)<br>on the Initial Rapid Proton Liberation during Hydrolysis of Adenosine Triphos-<br>phate by Myosin . . . . .      | 596 |
| RUTH WHISLER SHEARER. Irreversibility of the Alteration in RNA Transport.<br>Induced by an Azo-Dye Carcinogen in the Rat Liver . . . . .                                                             | 604 |
| MARTIN GROSS. Isolation and Characterization of an Antibody to a Highly Purified<br>Preparation of the Hemin-Controlled Translational Repressor from Rabbit Retic-<br>ulocytes . . . . .             | 611 |
| PHILIP C. LARIS and HARRIHAR A. PERSHADSINGH. Estimations of Membrane<br>Potentials in <i>Streptococcus faecalis</i> by Means of a Fluorescent Probe. . . . .                                        | 620 |
| M. LARSSON-RAŹNIKIEWICZ and B. SCHIERBECK. Studies on a Possible Phos-<br>phoryl-Enzyme Intermediate in the Catalytic Reaction of Yeast Phosphoglycerate<br>Kinase. . . . .                          | 627 |
| EDWIN C. HAHN. Stimulation of DNA Synthesis in Isolated Hela Nuclei by Calf<br>Thymus Histones . . . . .                                                                                             | 635 |
| KEITH SCHRAY and JUDITH P. KLINMAN. The Magnitude of Enzyme Transition<br>State Analog Binding Constants . . . . .                                                                                   | 641 |

|                                                                                                                                                                                                                                                                                |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| R. PARTHASARATHY, JEAN M. OHRT, and GIRISH B. CHHEDA. Conformation of <i>N</i> -(Purin-Glycarbamoyl) Glycine, A Hypermodified Base in tRNA . . . . .                                                                                                                           | 649 |
| DANIEL BRAULT and MICHEL ROUGEE. Binding of Imidazole and 2-Methylimidazole by Hemes in Organic Solvents. Evidence for Five-Coordination . . . . .                                                                                                                             | 654 |
| CHARLES E. MIZE and HOWARD G. WORTHEN. The Incorporation of Glycerol into Mitochondrial Lipids During Neonatal Renal Compensatory Growth . . . . .                                                                                                                             | 660 |
| AMIYA K. HAJRA. Enzymatic Transfer of the Acyl Group from Acyl Dihydroxyacetone Phosphate to Different Substrates . . . . .                                                                                                                                                    | 668 |
| JOHN HUMPHRIES, YIEH-PING WAN, GEORGE FISHER, KARL FOLKERS, and Cyril Y. Bowers. Acidic Analogs of the Luteinizing Hormone-Releasing Hormone and Conformational Aspects for Activity . . . . .                                                                                 | 675 |
| MARTIN L. PALL. Evidence for the Glycoprotein Nature of the Inducer of Sexuality in <i>Volvox</i> . . . . .                                                                                                                                                                    | 683 |
| HANS SOMMER and DANIEL V. SANTI. Purification and Amino Acid Analysis of An Active Site Peptide from Thymidylate Synthetase Containing Covalently Bound 5-Fluoro-2'-Deoxyuridylate and Methylenetetrahydrofolate . . . . .                                                     | 689 |
| PHILIP M. FARRELL, DAVID W. LUNDGREN and ANTHONY J. ADAMS. Choline Kinase and Choline Phosphotransferase in Developing Fetal Rat Lung . . . . .                                                                                                                                | 696 |
| SUSUMU NISHIMURA, YOICHI TAYA, YOSHIYUKI KUCHINO, and ZIRO OHASHI. Enzymatic Synthesis of 3-(3-Amino-3-Carboxypropyl) Uridine in <i>Escherichia coli</i> Prenylalanine Transfer RNA: Transfer of the 3-Amino-3-Carboxypropyl Group from <i>S</i> -Adenosylmethionine . . . . . | 702 |
| ROBERT G. WOLCOTT and PAUL D. BOYER. The Reversal of the Myosin and Actomyosin ATPase Reactions and the Free Energy of ATP Binding to Myosin . . . . .                                                                                                                         | 709 |
| ROBERT L. TRELSTAD. Human Aorta Collagens: Evidence for Three Distinct Species . . . . .                                                                                                                                                                                       | 717 |
| WRAY H. HUESTIS and HARDEN M. McCONNELL. A Functional Acetylcholine Receptor in the Human Erythrocyte . . . . .                                                                                                                                                                | 726 |
| SOPHIA TSAI and RALPH B. ARLINGHAUS. Formation of Mengovirus-like Particles in Cell-Free Extracts from Virus-Infected Cells . . . . .                                                                                                                                          | 733 |
| CHI-BOM CHAE and DONALD B. CARTER. Degradation of Chromosomal Proteins during Dissociation and Reconstitution of Chromatin . . . . .                                                                                                                                           | 740 |
| EDWARD S. REYNOLDS and MARY TREINEN MOSLEN. <i>In vivo</i> Covalent Binding of <sup>14</sup> CCl <sub>4</sub> Metabolites in Liver Microsomal Lipids . . . . .                                                                                                                 | 747 |
| M. ISEMURA, T. IKENAKA, T. MEGA and Y. MATSUSHIMA. On the Structure of Galactosylhydroxylysine and Glycopeptides Derived from Bovine Tracheal Cartilage . . . . .                                                                                                              | 751 |
| KINJI TSUKADA. Changes in Polynucleotide Ligase During Rat Liver Regeneration . . . . .                                                                                                                                                                                        | 758 |
| S. L. GUPTA, M. L. SOPORI, and P. LENGUEL. Release of the Inhibition of Messenger RNA Translation in Extracts of Interferon-Treated Ehrlich Ascites Tumor Cells by Added Transfer RNA . . . . .                                                                                | 763 |
| NAIF S. KARADSHEH, M. ANANTHANARAYANAN, and ABBURDI RAMAIAH. Stabilization of Active Form of Rabbit Liver Phosphofructokinase . . . . .                                                                                                                                        | 771 |
| TOSHIO ASAKURA, KAZUHIKO ADACHI, MASANORI SONO, SHLOMO FRIEDMAN, and ELIAS SCHWARTZ. Mechanical Stability of Hemoglobin Subunits: An Abnormality in $\beta$ -S-Subunits of Sickle Hemoglobin . . . . .                                                                         | 780 |
| ALAIN ZACHOWSKI and ALAIN PARAF. Use of a Concanavalin A Polymer to Isolate Right Side-Out Vesicles of Purified Plasma Membranes from Eukariotic Cells . . . . .                                                                                                               | 787 |
| GUY P. E. TELL and PEDRO CUATRECASAS. $\beta$ -Adrenergic Receptors: Stereospecificity and Lack of Affinity for Catechols . . . . .                                                                                                                                            | 793 |
| MARCIA ELHARRAR and ANDRÉ KIRN. Inhibition of DNA Synthesis by Isolated Liver Nuclei from Frog Virus 3 Infected Mice . . . . .                                                                                                                                                 | 801 |
| PETER J. DOLPHIN and DAVID RUBINSTEIN. The Metabolism of Very Low Density Lipoprotein and Chylomicrons by Purified Lipoprotein Lipase from Rat Heart and Adipose Tissue . . . . .                                                                                              | 808 |
| SAILEN MOOKERJEE and JAMES W. M. YUNG. Stimulation of Galactosyltransferase in Liver Microsomes by Lysolecithin . . . . .                                                                                                                                                      | 815 |
| MOSHE M. WERBER and AVRAHAM OPLATKA. Physico-Chemical Studies on the Light Chains of Myosin. III. Evidence for a Regulatory Role of a Rabbit Myosin Light Chain . . . . .                                                                                                      | 823 |
| P. R. CAREY and HENRY SCHNEIDER. Resonance Raman Spectra of Chymotrypsin Acyl Enzymes . . . . .                                                                                                                                                                                | 831 |
| CHA-MER WEI and CALVIN S. McLAUGHLIN. Structure-Function Relationship in the 12, 13-Epoxytrichothecenes Novel Inhibitors of Protein Synthesis . . . . .                                                                                                                        | 838 |



|                                                                                                                                                                                                                                                 |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| N. BODEN, M. C. HOLMES, and F. F. KNOWLES. Binding of Water to "Types I and II" $\text{Cu}^{2+}$ in Proteins . . . . .                                                                                                                          | 845 |
| EDITH WILSON MILES. Evidence that the Essential, Photosensitive Histidyl Residue in the $\beta_2$ Subunit of Tryptophan Synthetase is in the Pyridoxyl Peptide . . . . .                                                                        | 849 |
| ISRAEL SCHECHTER. Aggregates of Partially Purified mRNA Coding for Immunoglobulin Light-Chain. . . . .                                                                                                                                          | 857 |
| TUSN. T. WANG, KEITH J. DORRINGTON, and THEO HOFMANN. Activation of the Action of Penicillopepsin on Leucyl-Tyrosyl-Amide by a Nonsubstrate Peptide and Evidence for a Conformational Change Associated with a Secondary Binding Site . . . . . | 865 |
| INGEMAR BJÖRKHEM, HANS JÖRNVALL and ÅKE ÅKESON. Oxidation of $\omega$ -Hydroxylated Fatty Acids and Steroids by SS-Isoenzyme of Liver Alcohol Dehydrogenase . . . . .                                                                           | 870 |
| MING S. TUNG and ROBERT F. STEINER. The Application of Nanosecond Fluorometry to an Allosteric Protein . . . . .                                                                                                                                | 876 |
| W. P. JENCKS and M. I. PAGE. "Orbital Steering", Entropy, and Rate Accelerations . . . . .                                                                                                                                                      | 887 |
| DAVID E. BRADLEY. Adsorption of Bacteriophages Specific for <i>Pseudomonas aeruginosa</i> R Factors RP1 and R1822 . . . . .                                                                                                                     | 893 |
| C. D. SEUFERT, M. GRAF, G. JANSON, A. KUHN, and H. D. SÖLING. Formation of Free Acetate By Isolated Perfused Livers from Normal, Starved and Diabetic Rats . . . . .                                                                            | 901 |
| JOHN DARNELL and JOEL ROSENBLOOM. Ultracentrifugation as a Probe of Conformation of Unhydroxylated Procollagen and Collagen . . . . .                                                                                                           | 910 |
| S. MISHKIN and R. TURCOTTE. The Binding of Long Chain Fatty Acid CoA to Z <sub>1</sub> , A Cytoplasmic Protein Present in Liver and Other Tissues of the Rat . . . . .                                                                          | 918 |
| DANIEL AXELROD and MELVIN P. KLEIN. Fluorescent $\text{Ca}^{+2}$ Analogs in Nerve: Rare-Earth Ions . . . . .                                                                                                                                    | 927 |
| M. S. REITZ, JR., R. G. SMITH, E. A. ROSEBERRY, and R. C. GALLO. DNA-Directed and RNA-Primed DNA Synthesis in Microsomal and Mitochondrial Fractions of Normal Human Lymphocytes . . . . .                                                      | 934 |
| DONALD E. BUSHNELL, JAMES D. YAGER, JR., JOYCE E. BECKER, and VAN R. POTTER. Inhibition of Messenger RNA Accumulation but not translation in Ultraviolet Irradiated Hepatoma Cells. . . . .                                                     | 949 |
| ERRATA                                                                                                                                                                                                                                          |     |
| Volume 56, Number 3, February 4, 1974: Paul P. Cleary and Daniel Dykhuizen, "Enzymatic Reduction of D-Biotin-d-Sulfoxide with Cell-Free Extracts of <i>Escherichia coli</i> ", pp. 629-634 . . . . .                                            | 957 |
| Volume 57, Number 1, March 15, 1974: H. P. Wang, D. Pfeiffer, Tokuji Kimura and T. T. Tchen, "Phospholipids of Adrenal Cortex Mitochondria and the Steroid Hydroxylases", pp. 93-99 . . . . .                                                   | 957 |

## Volume 57, Number 4, April 23, 1974

|                                                                                                                                                    |      |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------|
| AUTHOR INDEX, Volume 57, Number 4 . . . . .                                                                                                        | ii   |
| R. J. EISENBERG, M. ELCHISAK and C. LAI. Glycogen Accumulation by Pleomorphic Cells of <i>Streptococcus sanguis</i> . . . . .                      | 959  |
| D. S. AULD, H. KAWAGUCHI, D. M. LIVINGSTON and B. L. VALLEE. Reverse Transcriptase from Avian Myeloblastosis Virus: A Zinc Metalloenzyme . . . . . | 967  |
| MITSUHIRO OHTA and KYOGO HAYASHI. Chemical Modification of the Tryptophan Residue in Toxin B from the Venom of the Indian Cobra . . . . .          | 973  |
| P. K. SARKAR and A. A. MOSCONA. Binding of Receptor-Hydrocortisone Complexes to Isolated Nuclei from Embryonic Neural Retina Cells . . . . .       | 980  |
| JOHN D. DOHERTY and F. MATSUMURA. A Highly Ion-Sensitive ATP-Phosphorylation System in Lobster Nerve . . . . .                                     | 987  |
| MICHAEL J. GLEASON and ALLEN B. RAWITCH. Agarose Gel Filtration of Fluorescent Labeled Protein-Sodium Dodecyl Sulfate Complexes . . . . .          | 993  |
| THOMAS O. BALDWIN. The Binding and Spectral Alterations of Oxidized Flavin Mononucleotide by Bacterial Luciferase . . . . .                        | 1000 |



|                                                                                                                                                                                                                                           |        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| HAJIME MATSUSHITA, M. NOGUCHI, and E. TAMAKI. Conjugate of Bovine Serum Albumin with Nicotine . . . . .                                                                                                                                   | 1006   |
| RICHARD T. RUETTINGER, STEVEN T. OLSON, RODNEY F. BOYER and MINOR J. COON. Identification of the $\omega$ -Hydroxylase of <i>Pseudomonas oleovorans</i> as a Nonheme Iron Protein Requiring Phospholipid for Catalytic Activity . . . . . | 1011   |
| BARRIE ENTSCH, VINCENT MASSEY, and DAVID P. BALLOU. Intermediates in Flavoprotein Catalyzed Hydroxylations . . . . .                                                                                                                      | 1018 ✓ |
| WILLIAM F. NACCARATO and WILLIAM W. WELLS. Identification of 6-O- $\beta$ -D-Galactopyranosyl MYO-Inositol: A New Form of MYO-Inositol in Mammals . . . . .                                                                               | 1026   |
| M. P. COOKE, B. G. ARCHER, and H. KRAKAUER. The Preparation of High Molecular Weight Divalent "Antigens" of Defined Size . . . . .                                                                                                        | 1032   |
| S. HAYASHI, R. KOOMOTO, A. YANO, S. ISHIGAMI, G. TSUJINO, S. SAEKI, and T. TANAKA. Abnormality in a Specific Protein of the Erythrocyte Membrane in Hereditary Spherocytosis . . . . .                                                    | 1038   |
| R. HOELDTKE, T. LLOYD and S. KAUFMAN. An Immunochemical Study of the Induction of Tyrosine Hydroxylase in Rat Adrenal Glands . . . . .                                                                                                    | 1045   |
| FRANCIS X. HASSELBERGER, BILLY ALLEN, E. K. PARUCHURI, MARVIN CHARLES, and ROBERT W. COUGHLIN. Immobilized Enzymes: Lactase Bonded to Stainless Steel and Other Dense Carriers for Use in Fluidized Bed Reactors . . . . .                | 1054   |
| DOUGLAS R. HUNTER. Effect of Cyanide on Respiratory Control of Electron Transporting Particles . . . . .                                                                                                                                  | 1063   |
| ATTILA FONYÓ. Phosphate Carrier of Liver Mitochondria: Two Equivalent SH-Groups in the Carrier Unit . . . . .                                                                                                                             | 1069   |
| MOSHE YANIV, ODILE CROISSANT, and FRANCOIS CUZIN. Location of the T4 Gene 32 Protein-Binding Site on Polyoma Virus DNA . . . . .                                                                                                          | 1074   |
| FERDINAND HUCHO and MICHAEL JANDA. Investigation of the Quaternary Structure of Beef Liver Glutamate Dehydrogenase with Bifunctional Reagents. . . . .                                                                                    | 1080   |
| M. ASHIDA, K. DOHKE and E. OHNISHI. Activation of Prephenoloxidase. III. Release of a Peptide from Prephenoloxidase by the Activating Enzyme . . . . .                                                                                    | 1089   |
| WILLIAM A. FRAZIER, LINDA F. BOYD, ANDRZEJ SZUTOWICZ, MORRIS W. PULLIAM, and RALPH A. BRADSHAW. Specific Binding Sites for $^{125}$ I-Nerve Growth Factor in Peripheral Tissues and Brain . . . . .                                       | 1096   |
| W. J. WALLACE, J. C. MAXWELL, and W. S. CAUGHEY. The Mechanisms of Hemoglobin Autooxidation Evidence for Proton-Assisted Nucleophilic Displacement of Superoxide by Anions . . . . .                                                      | 1104   |
| SIMON KARPATKIN and MARGARET KARPATKIN. Inhibition of the Enzymatic Activity of Thrombin by Concanavalin A . . . . .                                                                                                                      | 1111   |
| T. OHNO, T. KESADO, J. AWAYA, and S. OMURA. Traget of Inhibition by the Anti-Lipogenic Antibiotic Cerulenin of Sterol Synthesis in Yeast . . . . .                                                                                        | 1119   |
| H. H. DEARMAN, Y. NOSAKA, and K. AKASAKA. Interaction of <i>N</i> -Methyl Phenazinium Radical Cation with Single-Stranded Polyriboadenylic Acid . . . . .                                                                                 | 1125   |
| KATARÍNA POLÁKOVÁ and G. RUSS. Localization of Major Group-Specific Polypeptides in the Avian RNA Tumor Viruses . . . . .                                                                                                                 | 1130   |
| D. M. GLOVER. Coupling of Polyoma DNA and RNA Synthesis . . . . .                                                                                                                                                                         | 1137   |
| ELLIS L. KLINE, CAROLYN S. BROWN, WILLIAM G. COLEMAN, JR., and H. E. UMBARGER. Regulation of Isoleucine-Valine Biosynthesis in an <i>ilvDAC</i> Deletion Strain of <i>Escherichia coli</i> K-12 . . . . .                                 | 1144   |
| C. A. WATERS, J. R. MURPHY, and J. W. HASTINGS. Flavin Binding by Bacterial Luciferase: Affinity Chromatography of Bacterial Luciferase . . . . .                                                                                         | 1152   |
| INGEMAR BERGGÅRD. Isolation and Characteristics of a Rabbit $\beta_2$ -Microglobulin: Comparison with Human $\beta_2$ -Microglobulin . . . . .                                                                                            | 1159   |
| J. M. VIDGOFF, A. POCKER, T. L. HULLAR, and E. H. FISCHER. Interaction of Muscle Glycogen Phosphorylase with Pyridoxal 5'-Methylenephosphonate . . . . .                                                                                  | 1166   |
| H. BRUCE BOSMANN, KENNETH R. CASE, FRANK E. YOUNG, and ANADI N. CHATTERJEE. Surface Electrokinetic Properties of Two Strains of <i>staphylococcus aureus</i> during Their Cell Growth Cycle . . . . .                                     | 1175   |
| JAMES T. BAHR and RICHARD G. JENSEN. On the Activity of Ribulosediphosphate Carboxylase with CO <sub>2</sub> and O <sub>2</sub> from Leaf Extracts of <i>Zea mays</i> . . . . .                                                           | 1180   |
| BO F. ÖBERG and AARON J. SHATKIN. Translation of Mengovirus RNA in Ehrlich Ascites Cell Extracts . . . . .                                                                                                                                | 1186   |
| D. AUNIS, M. T. MIRAS-PORTUGAL, and P. MANDEL. pH-Dependent Deuterium Solvent Isotope Effects on Bovine Adrenal Medullary Dopamine- $\beta$ -Hydroxylase . . . . .                                                                        | 1192   |
| A. P. SINGH and P. D. BRAGG. Energization of Phenylalanine Transport and Energy-Dependent Transhydrogenase by ATP in Cytochrome-Deficient <i>Escherichia coli</i> K12 . . . . .                                                           | 1200   |

|                                                                                                                                                                                                                               |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| E. D. THOMPSON and L. W. PARKS. The Effect of Altered Sterol Composition on Cytochrome Oxidase and S-Adenosylmethionine: $\Delta$ 24 Sterol Methyltransferase Enzymes of Yeast Mitochondria . . . . .                         | 1207 |
| WARREN R. ELLISON, JAMES D. LUECK, and HERBERT J. FROMM. Studies on the Kinetics and Mechanism of Orthophosphate Activation of Bovine Brain Hexokinase . . . . .                                                              | 1214 |
| CYNTHIA R. CHUANG and GRADY F. SAUNDERS. Complexity of Human Satellite A DNA . . . . .                                                                                                                                        | 1221 |
| R. CHUANG, L. CHUANG, and J. LASZLO. A New Eukaryotic RNA Polymerase Factor: A Factor from Chicken Myeloblastosis Cells Which Stimulated Transcription of Denatured DNA. . . . .                                              | 1231 |
| J. L. NUSSBAUM, J. F. ROUAYRENC, P. MANDEL, J. JOLLÈS, and P. JOLLÈS. Isolation and Terminal Sequence Determination of the Major Rat Brain Myelin Proteolipid P7 Apoprotein . . . . .                                         | 1240 |
| M. FUJINO, I. YAMAZAKI, S. KOBAYASHI, T. FUKUDA, S. SHINAGAWA, R. NAKAYAMA, W. F. WHITE, and R. H. RIPPEL. Some Analogs of Luteinizing Hormone Releasing Hormone (LH-RH) Having Intense Ovulation-Inducing Activity . . . . . | 1248 |
| MORIHIRO MATSUDA and MASAHIKO YONEDA. Dissociation of Tetanus Neurotoxin into Two Polypeptide Fragments . . . . .                                                                                                             | 1257 |
| TOSTEN HELTING and OSWALD ZWISLER. Enzymatic Breakdown of Tetanus Toxin . . . . .                                                                                                                                             | 1263 |
| ROY B. VERDERY III and ALEX V. NICHOLS. Interaction of Lysolecithin Micelles and Lecithin Vesicles with Apolipoprotein GLN I from Serum High Density Lipoprotein . . . . .                                                    | 1271 |
| J. VOIGT, G. SANDER, K. NAGEL, and A. PARMEGGIANI. Effect of $\text{NH}_4^+$ and $\text{K}^+$ on the Activity of the Ribosomal Subunits in the EF-G- and EF-T-Dependent GTP Hydrolysis . . . . .                              | 1279 |
| CLAUDIO CONTI and LESLIE S. FORSTER. Nonexponential Decay of Indole Fluorescence — The Red-Edge Effect. . . . .                                                                                                               | 1287 |
| M. HERBST and P. POINTEK. Studies on the Origin of Resting Tension of Skeletal Muscle . . . . .                                                                                                                               | 1293 |
| ROBERT A. RUSH, PAUL E. THOMAS, SAMUEL H. KINDLER, and SIDNEY UDENFRIEND. The Interaction of Dopamine- $\beta$ -Hydroxylase with Concanavalin A and its Use in Enzyme Purification . . . . .                                  | 1301 |
| AUTHOR INDEX. Volume 57. . . . .                                                                                                                                                                                              | 1307 |



## Information for Contributors

BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS is devoted to the rapid dissemination of timely and significant observations in the diverse fields of modern experimental biology. Manuscripts submitted should be so written as to clearly emphasize the novel aspects of the information reported, with the understanding that the same material has not been, nor will be, submitted for publication elsewhere.

Manuscripts in duplicate may be sent to any one of the editors whose names and addresses are listed on the inside front cover.

**To ensure rapid and accurate publication, it is essential that manuscripts conform to the instructions which follow. Manuscripts which are not in accordance with these specifications may be returned.**

### Preparation of Manuscripts

*Article length* should not exceed 5 typewritten pages, double-spaced on  $8.5 \times 11$  in. high quality paper (the complete manuscript, including space occupied by figures and tables, should not exceed 8 pages).

*Summary.* Each article must be preceded by a brief summary, typed single-spaced, not exceeding 10 lines (approximately 100-150 words). This paragraph should adequately summarize the pertinent findings of the paper.

*Typing.* Articles are reproduced directly from the submitted manuscript as camera-ready copy. Manuscripts must therefore be typewritten on good quality white bond paper. A black silk or carbon typewriter ribbon should be used. Special care should be taken to ensure a sharp, clean impression of letters throughout. Use of an electric typewriter is strongly recommended. Erasures should be avoided. Care must also be taken to avoid errors in spelling, word division and punctuation.

Manuscripts should be double-spaced on one side of the sheet; **references, footnotes and figure legends should be single-spaced.** Typing area of the page must be as close as possible to 6.5 in. wide and 9.5 in. long.

*Symbols and Abbreviations* defined in the Commission on Biochemical Nomenclature Document No. 1 (*Arch. Biochem. Biophys.* (1966) **115**, 1-12) may be used without definition. Use of all other abbreviations and symbols is to be avoided. When abbreviations are essential, they should be created in accordance with the rules of the NAS-NRC Office of Biochemical Nomenclature and **must be defined in a footnote**, rather than in the text. Such abbreviations **must not** be used in the Summary. The improper use of abbreviations may necessitate the return of manuscripts for retyping, thereby delaying publication.

*Enzyme* names should not be abbreviated except when the substrate has an approved abbreviation (e.g., ATPase). Use of the Enzyme Commission ("EC") code number is recommended.

**Isotopes should be styled following the recommendations of the IUB Commission of Editors of Biochemical Journals.** The symbol for the isotope introduced should be placed in square brackets directly attached to the front of the name (e.g., [ $^{32}\text{P}$ ]CMP). Note that the isotope number should only be used as a (superior) prefix to the atomic symbol, not to an abbreviation.

For further information regarding nomenclature authors are advised to consult the Instructions to Authors of the *Archives of Biochemistry and Biophysics* (1973) **154**, iii-xii. Reprints are available from the Publisher.

*Footnotes* should be typed single-spaced at the foot of the page on which they are mentioned in the text. References and figure legends should be typed single-spaced on separate pages.

*Illustrations and Tables.* **Do not attempt to insert figures, figure legends or tables into the text.** This will be done by the Publisher.

All drawings should be done with a mechanical lettering set (e.g., Leroy; lettering size 120 or 140) and black ink. Do not use press-on lettering; typewritten lettering is not acceptable.

Figures will be reduced to fit within the type area of the page (approximately  $5 \times 8$  in.); the original drawings must be planned accordingly.

Glossy photographs of drawings are acceptable provided they are sharp, clear prints with an even *black* density.

Mathematical or chemical symbols that cannot be typed should be inked in carefully in black. Structural formulas should be drawn in black ink.

Illustrations and tables should be submitted on separate sheets.

*Page Numbers and Headings.* Page numbers should be typed at the top of the page.

The title of the paper should be typed in capital letters near the top of the first page, with the name(s) and affiliation(s) of the author(s) typed just below. Headings within the article should be arranged according to their relative importance.

*References* to the literature should be cited by the number in parentheses in the text and listed in numerical order in a single-spaced typed list placed at the end of the manuscript. Abbreviations of journals should conform to those of *Chemical Abstracts Service Source Index*, 1969. Note the following examples.

For a journal article:

1. Chatteraj, D. K., and Bull, H. B. (1971) *Arch. Biochem. Biophys.* 142, 363-370.

For a book by one or more authors:

2. Robison, G. A., Sutherland, E. W., and Butcher, E. (1971) *Cyclic AMP*, pp. 298-302, Academic Press, New York.

**Note that inclusive pagination must be given.**

*Mailing.* To avoid creasing, please place manuscripts between cardboards when mailing.

*Acknowledgment of Receipt.* Authors desiring acknowledgment of receipt of manuscript should enclose a stamped self-addressed card.

*Reprints.* Reprint order forms are sent to the authors immediately upon acceptance of their manuscript. The price list is included.





